

# SPECIES

## To Cite:

Joshi R. Checklist of butterfly species in Bheemdatt municipality, Kanchanpur district. *Species* 2023; 24: e26s1026  
doi: <https://doi.org/10.54905/dissi/v24i73/e26s1026>

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## Peer-Review History

Received: 12 January 2023  
Reviewed & Revised: 15/January/2023 to 20/March/2023  
Accepted: 23 March 2023  
Published: 27 March 2023

## Peer-Review Model

External peer-review was done through double-blind method.

Species  
pISSN 2319–5746; eISSN 2319–5754



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# Checklist of butterfly species in Bheemdatt municipality, Kanchanpur district

Ritu Joshi

## ABSTRACT

Butterflies are the most beautiful creature of the nature with magnificent colors. They play crucial role in maintaining ecosystem and as indicators of climate change. The purpose of this research was to examine the butterfly variety in the Sudurpaschim Province of the Kanchanpur district of the Bheemdatt municipality, from the month of April to November 2020. During this study, random observation method was used to locate different butterflies and those were captured on mobile phones. A total 52 species were recorded belonging to 5 families. Family Nymphalidae displayed highest species with 24 species and followed by families Lycaenidae with 10 species, Pieridae with 9 species, Papilionidae with 4 species and Hesperiidae with 5 species respectively. More exploratory work is required to estimate the population size and species abundance of the insects since the area is rich in flora, which offers a very appropriate environment and location for biodiversity. It is important to do systematic study, including diversity monitoring, also to prepare the checklist of butterflies along the elevational gradient in the Bheemdatt Municipality.

**Keywords:** Butterflies; Checklist; Diversity; Kanchanpur district; Nymphalidae

## 1. INTRODUCTION

The Indo-Malayan and Palearctic biogeographic domains meet in the mountainous nation of Nepal, which is situated halfway between India and China. In the Hindu Kush Himalayan area, it takes up around one-third of the space (Paudel et al., 2012). It has a wide variety of climatic fluctuation (including microclimate) and topography variance, which creates habitats for distinctive biodiversity (Paudel et al., 2012; Subedi et al., 2020).

Butterflies are among the categories of insects that have undergone the greatest taxonomic study. Their colors and patterning can serve as environmental indicators (Mayur et al., 2013). They are also highly valued in terms of aesthetics and commerce (Ahsan & Javaid, 1975) and have received worldwide attention (Fjellstad, 1998). According to estimates, there are more than 20,000 species of butterflies in the world (Ghazanfar et al., 2016). Within a relatively narrow geographic region of Nepal, 693 species of butterflies, including 29 subspecies, are found (Sapkota et al., 2020). The IUCN Red List classifies 142 species of butterflies in Nepal, of which 12 are endangered, 43 are vulnerable and 87 are at risk of extinction (Paudel et al., 2012).

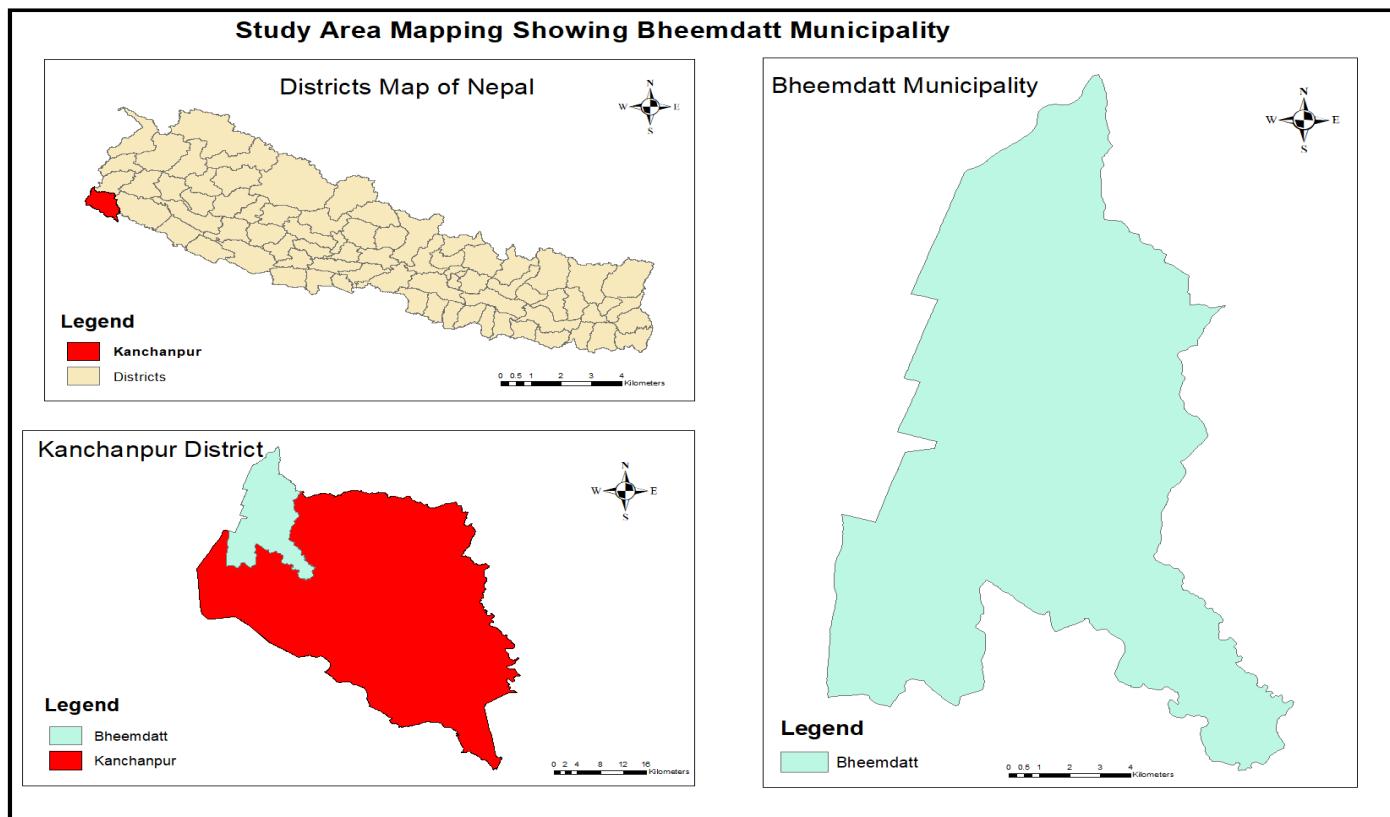
Butterflies are considered to be the best subject for ecological study of a forest since they serve as indicators of a healthy habitat and ecosystem (Molina & Palma, 1996). Butterflies offer vital ecological services to native wild plant species, crops and livestock in many habitats across the world. Consequently, it is crucial to preserve them in order to preserve the agricultural and natural ecosystems' productivity (Davis et al., 2008). They host a variety of parasitoids that control agricultural pests and serve as food for birds and other predators (Summerville et al., 2001). They are utilized as climate indicators since they are also used to determine the climate of a certain location (Crozier, 2004).

Butterflies are the most researched insect in the world due to their huge ecological influence and commercial importance (Dahal, 2017). In contrast, there have been relatively few research on butterflies in the western region of Nepal (Khanal, 1999; Khanal, 2009; Paudel, 2019; Shrestha et al., 1999; Smith, 1977; Smith, 1980; Suwal et al., 2019a; Suwal et al., 2019b); the circumstances are the same in the Sudurpaschim province of Nepal. This research provides the baseline information for butterflies species in the study area and a solid foundation further research on butterflies.

## 2. MATERIAL AND METHOD

### Study area

The study was conducted in the ward number 16 of Bheemdatt municipality of Kanchanpur district. The district is located in Nepal's southern region. It is situated in  $28^{\circ} 94' 46.32''$  N latitude and  $80^{\circ} 14' 58.62''$  E longitude. This region is draped in vegetation. Cultivated land and homesteads include trees, shrubs, grasses, herbs and climbers that provide butterflies their nectar and rest. The dominated tree species such as *Shorea robusta*, *Dalbergia sisoo* and in a similar way the main agricultural crops grown in the research region are maize, wheat and rice. This region has a subtropical monsoon climate with 1,579 mm (62.2 in) of annual rainfall on average, with August being the wettest month. December and January are very chilly months with day time highs of 7–12°C (45–54°F) with occasional frost (Figure 1).



**Figure 1** Study area mapping showing Bheemdatt Municipality

### Method

From April 2020 to November 2020, different species of butterflies were counted using a random observation approach. The observations took place twice a week for two hours each, from 4:00 to 6:00 pm and 10:00 to 12:00 in the morning. Throughout the research, these observational timings remained the same, but we also kept track of any unintentional sightings that occurred

outside of these predetermined times. The butterflies were seen and images of them taken using a phone camera (Redmi 812 MP, f/1.8, 1/2.55", 1.4µm) and while capturing picture not a single butterfly was harmed. For identification of butterflies, we looked for a reference book "Butterflies of Begnas and Rupa Watershed area" (Smith et al., 2016) and some reputed internet websites like Butterflies of India (<https://www.ifoundbutterflies.org/>) was visited.

### 3. RESULT

From the research region, altogether 52 species of butterflies from 5 distinct families were observed and recognized, as shown below (Table 1). The biggest number of species among the five families was found in the Nymphalidae family (24 species), which was followed by the Lycaenidae (10 species), Pieridae (9 species), Papilionidae (4 species), and Hesperiidae (5 species) families, respectively.

**Table 1** Butterfly species discovered in the study region are listed by family, common name, and scientific name.

Family Nymphalidae	SN	Common Name	Scientific Name	Habitat
	1	Oriental Peacock Pansy	<i>Precis almanac</i>	Open country area, Rice Field and Road side
	2	Lemon Pansy	<i>Precis lemonias</i>	Garden, Open wooded areas
	3	Common Castor (DSF)	<i>Ariadne merione</i>	Open country area, Resting in leaves
	4	Grey Pansy	<i>Precis atlites</i>	Wet zone, Home garden
	5	Common Sailor	<i>Neptis hylas</i>	Prefer Forested area
	6	Common Crow	<i>Euploea core</i>	Dry zone, Open vegetation
	7	Common Baron	<i>Euthalia aconthea</i>	Urban areas, wastelands
	8	Common Mime	<i>Papilio clytia</i>	Urban garden and cultivated field
	9	Great Egg fly	<i>Hypolimnas bolina</i>	Forested area
	10	Danied Egg fly	<i>Hypolimnas misippus</i>	Open country, Scrubland and moist areas
	11	Common Lascar	<i>Pantoporia hordonia</i>	Wood, Forest
	12	Common Leopard	<i>Phalanta phalantha</i>	Sparsely woodland garden and scrublands
	13	Chocolate Pansy	<i>Precis iphita</i>	Open country side, Forest edges
	14	Painted Lady	<i>Vanessa cardui</i>	Parks, meadows, fields
	15	Grey Count	<i>Tanaecia julii</i>	Moist Deciduous Forest
	16	Common Palm fly	<i>Elymnias hypermnestra</i>	Forested areas
	17	Plain Tiger	<i>Danaus chrysippus</i>	Deciduous forests, Deserts
	18	Common Tiger	<i>Danaus genutia</i>	Open country, Garden
	19	Blue Grassy Tiger	<i>Tirumala limniace</i>	Forests and verdant home garden
	20	Common Four Ring	<i>Ypthima huebneri</i>	Open country
	21	Common Evening Brown	<i>Melanitis leda</i>	Forests and home garden
	22	Common Brush Brown	<i>Mycalesis perseus</i>	Shady places
	23	Dark Banded Brush Brown	<i>Mycalesis mineus</i>	Moist and Shady area
	24	Jungle Brown	<i>Orsotriaena medus</i>	Open woodland
Family Lycaenidae	1	Pale Grass Blue	<i>Pseudozizeeria maha</i>	Urban parks, Grasslands
	2	Yam fly	<i>Loxura atymnus</i>	Gardens, Forests
	3	Common Cearulean	<i>Jamides celeno</i>	Wastelands and Gardens
	4	Zebra Blue	<i>Leptotes plinius</i>	Open woodlands, around shrubs
	5	White Banded Headge Blue	<i>Lestranius transpectus</i>	Grassland, Gardens
	6	Common Pierrot	<i>Castalius rosimon</i>	Open vegetation, Wastelands
	7	Striped Pierrot	<i>Tarucus nara</i>	Open vegetation, Wastelands
	8	Gram Blue	<i>Cupido lacturnus</i>	Flowery and grassy area

	9	Green Oak Blue	<i>Arhopala paramuta</i>	Gardens
	10	Less Grass Blue	<i>Zizina otis</i>	Grassy patches
Family Pieridae	1	Dark Clouded Yellow	<i>Colias fieldi</i>	Open grassland, chalk grassland
	2	Common Grass Yellow	<i>Terias hecate</i>	Open grass and Scrub habitat
	3	Lemon Emigrant	<i>Catopsilia Pomona</i>	Lowland, dry zone
	4	Mottled Emigrant	<i>Catopsilia pyranthe</i>	Gardens, Woodlands, Wastelands
	5	Bath White	<i>Pontia daplidice</i>	Dry slopes and rough ground
	6	Common Jezebel	<i>Delias hyparete</i>	Open woodlands, Hill Forests
	7	Pioneer	<i>Belenois aurota</i>	Dry zone scrublands
	8	Common Wandere	<i>Pareronia valeria</i>	Open woodlands
	9	Indian Cabbage White	<i>Pieris canidia</i>	Open country, Grassy lands
Family Papilionidae	1	Lime Swallowtail	<i>Papilio demoleus</i>	Open area, Open Forest
	2	Common Mormon	<i>Papilio polytes</i>	Open plains,
	3	Common Blue Bottle	<i>Graphium sarpedon</i>	Moist, low level rain forest
	4	Spot Swordtail	<i>Graphium nomius</i>	Bushes, Forest red area
Family Hesperiidae	1	Grass Demon	<i>Udaspes folus</i>	Deciduous forest
	2	Rice (swift species)	<i>Borbo cinara</i>	Grassy lands
	3	Red Eye	<i>Matapa aria</i>	Lowland rainforest
	4	Banana Skipper	<i>Erionota thrax</i>	Open area
	5	Common Small Flat	<i>Sarangesa dasahara</i>	Deciduous forest

**Images of Butterfly Species****Family Nymphalidae**

			
1. Peacock Pansy	2. Lemon Pansy	3. Common Castor	4. Grey Pansy
			
5. Common sailor	6. Common Crow	7. Common Baron	8. Common mime

			
9. Great Eggfly	10. Danied Eggfly	11. Common Lascar	12. Common Leopard
			
13. Chocolate Pansy	14. Painted Lady	15. Grey Count	16. Common Palmfly
			
b 17. Plain Tiger	18. Common Tiger	19. Blue Glassy Tiger	20. Common Four ring
			
21. Common Evening brown	22. Common Brushbrown	23. Dark banded Brushbrown	24. Jungle Brown

*Family Lycaenidae*

			
1. Pale Grass Blue	2. Yamfly	3. Common Cerulean	4. Zebra Blue



5. White Banded Hedge Blue



6. Common Pierrot



7. Striped Pierrot



8. Green Oak Blue



9. Gram Blue



10. Less Gram Blue

*Family Pieridae*

1. Dark Clouded Yellow



2. Common Grass Yellow



3. Lemon Emigrant



Lemon Emigrant



4. Mottled Emigrant



5. Bath White



6. Common Jezebel



7. Pioneer



8. Common Wandere

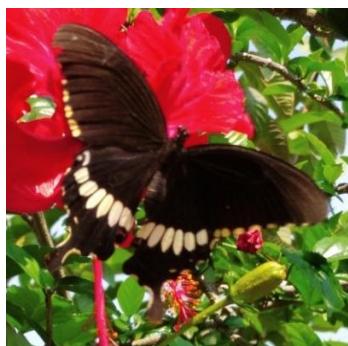


9. Indian Cabbage White

## Family Papilionidae



1. Lime Swallowtail



2. Common Mormon



3. Common Blue Bottle



4. Spot Swordtail

## Family Hesperiidae



1. Grass Demon



2. Rice Swift



3. Red Eye



4. Banana Skipper



5. Common Small Flat

Note: All the images were taken by Author.

■ Nymphalidae ■ Lycaenidae ■ Pieridae ■ Papilionidae ■ Hesperiidae

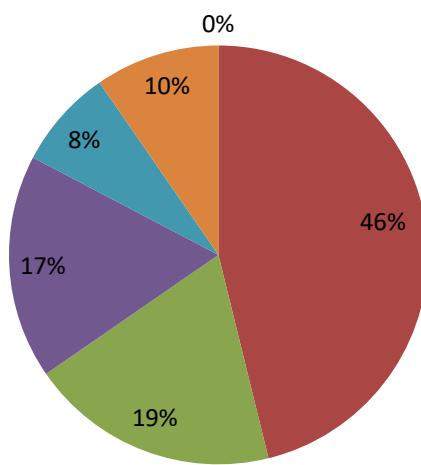


Figure 2 Family wise composition of the butterflies in the study area

## 4. DISCUSSION

From total 52 species butterflies, family Nymphalidae has dominated. The dominance of the Nymphalidae family is due to the fact that it is one of the largest families in terms of species richness and is extensively spread in nature (Khyade et al., 2018; Pena and Espeland, 2015). Nymphalidae's dominance may possibly be a result of their ecological adaption and strong spreading abilities. The butterfly diversity and distribution decreases with increase in human disturbance, habitat fragmentation and forest fire (Khanal et al., 2013). As the butterflies are ecological indicators, the decrease of population should be the indication of habitat degradation (Bourn & Thomas, 2002; Chinaru & Joseph, 2011). During the course of study, it is observed that more exploratory work is required to estimate the population size and species abundance of the insects since the area is rich in flora, which offers a very appropriate environment and location for biodiversity.

## 5. CONCLUSION

During this study, altogether 52 species of butterflies were recorded which belongs to the five families. Among five families, 46% belongs to the Nymphalidae and 19%, 17%, 10%, 8% belongs to the Lycaenidae, Pieridae, Papilionidae and Hesperiidae respectively. However, Nepal hasn't carried out in-depth research that frequently concentrated on aspects of species and ecosystems, such as height, land use and habitat type. To update the butterfly species checklist in this region, regular observation and research are required. In the research region, no conservation efforts for butterflies were made. The local government should thus establish effective conservation measures and regulations to preserve these wonderful butterflies.

### Acknowledgement

I would like to thank Mr Surendra Pariyar and Kismat Neupane for helping me in species identification. I am grateful towards my colleague Mr Sanskar Subedi for proofreading the manuscript. I thank my friends for continuous support and providing me regular help and motivation.

### Informed consent

Not applicable.

### Ethical approval

The Animal ethical guidelines are followed in the study for species observation & identification.

### Conflicts of interests

The authors declare that there are no conflicts of interests.

### Funding

The study has not received any external funding.

### Data and materials availability

All data associated with this study are present in the paper.

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